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Increasing the survival of probiotic bacteria in dairy products using medicinal plants

Razzagh Mahmoudi
Qazvin University of Medical Sciences, Iran

Statement of the Problem: Increasing the survival of probiotic bacteria and improve the hygienic quality of dairy products using natural preservatives is widely accepted today, It has long been recognized that some essential oils (EOs) have antimicrobial properties and that they can be used as food flavoring agents or preservatives, and for medicinal purposes. However, to establish the usefulness of natural preservatives, they must be evaluated alone and in combination with other preservation factors (such as probiotic bacteria) to determine whether there are synergistic effects and to devise effective combinations. In this study the effect of *Teucrium polium, cumin* and *Mentha longifolia* L. EO on *Lactobacillus* casei survivability and flavor characteristics of yoghurt, cheese and ayran were studied.

Methodology & Theoretical Orientation: M. longifolia L. (0, 50, 150 and 300 ppm), T. polium (40, 60 and 80 ppm) and M. longifolia L. (50, 100, 200 and 300 ppm) EOs and Lactobacillus casei (10^8-10^9 CFU/mL) were used in cheese, yoghurt and ayran, respectively, viability of L. casei and organoleptic properties of these dairy products samples were analyzed during storage period.

Findings: The survival of L. casei decreased throughout the storage period. Nevertheless, probiotic dairy products and treatment containing medium concentration EOs (*T. polium:* 60 ppm, *M. longifolia*: 150 ppm in yoghurt and 200 ppm in ayran) had the highest ($P<0.05$) viable count of probiotic bacteria. But the lowest concentration of these EOs was the most appropriate treatment ($P<0.05$) in sensory assessment.

Conclusion & Significance: Based on our results, dairy products such as yoghurt, cheese and ayran can be a very suitable food product to carry relevant probiotic bacteria while adding certain herbal EOs.

r.mahmodi@yahoo.com

Dairy value chain analysis in Harar and Dire Dawa milk-shed areas, Ethiopia

Tarekegn Getachew Daba
Haramaya University, Ethiopia

The study is aimed at mapping the dairy value chain, assessing constraints and opportunities for the development of the dairy sector, and identifying factor affecting channel choice decisions of smallholder dairy producers in and around Harar and Dire Dawa milkshed areas. Necessary data were collected from a total of 93 producers, six collectors, seven wholesalers, seven retailers, and ten consumers in the study areas. To analyze the collected data, both descriptive and multinomial logit model were employed. The descriptive statistics result obtained indicates that producers mostly sell the raw milk to collectors and to consumers as compared to the other actors. Collectors, on the other hand, sell the milk to wholesalers and retailers, and wholesalers mainly sell the milk to retailers. Almost all of the dairy farmers own local dairy cattle breeds. The channel choices available to producers include selling to collectors, wholesalers, retailers, and directly to consumers. Considering collectors as a base channel, the multinomial model output indicated that area dummy, breed type, availability of separate milking place, and supply of hay were found negatively and significantly determining the producers choice to sell to wholesaler, retailers, and consumers. In contrast, education status of the household head and the period in which milk stays after milking were found to positively and significantly determine producers' choice to sell not to collectors. The major recommendations include provision of training and credit and encouraging farmers to involve in collective actions, among others.

targech23@gmail.com